NCTC Lecture Series Presents

"The Life and Legacy of Rachel Carson"

William Souder

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Mark Madison: Welcome to the National Conservation Training Center. My name is Mark Madison, and I'm the Fish and Wildlife Service Historian, who coordinates this series. I'd like to welcome you all here this evening and before I introduce our speaker, just make a couple brief announcements. One, we will be selling his book, which I'm sure after his talk (break in tape). It's a great pleasure to bring back William Souder, who kindly came here about four years ago, talking about his second book, *Under a Wild Sky*; a beautiful Pulitzer nominated biography of John James Audubon. We liked Bill so much we highly encouraged him to write a book about a former Fish and Wildlife Service employee, an obscure young woman named Rachel Carson, so we could get him back again. He's kindly obliged and we're very fortunate to hear from him this evening. Bill is a journalist and an author, his work has appeared in the *Washington Post* among other periodicals. His first book, was a particular interest to our biologists, it was called *A Plague of Frogs* about amphibian deformities, and what was causing them. Like I said his second book was a biography of John James Audubon. And his most recent book, which I have here hot off the press, just came out a month or so ago, is called *On a Farther Shore: The Life and Legacy of Rachel Carson*. It came out almost exactly on the 50th Anniversary of Carson's original book, Silent Spring. It's a beautiful, evocative, and culturally informative discussion of Rachel Carson, her biography, her ideas, and the importance of them in creating a brand new American environmental movement. So please give a very warm welcome to William Souder.

(Applause)

William Souder: Thank you, thank you. Thank you all for coming out tonight to this wonderful facility, I love coming here. It's the coolest place and I always remind these guys that they're so fortunate to work at the National Conservation Training Center, it's a really terrific facility. Nice to be back here, nice to see all of you; I guess I am the warm up act for the Presidential Debate later tonight. I promise no spin and I promise to finish in time so that those of you who can't get enough of politics will be able to go see it, although I don't know who that would be at this point. I'm sure we all want to go see the

debates, so we will finish on time for that. Well here to talk about Rachel Carson, and as Mark indicated, last month on the 27th of September was the 50th Anniversary of *Silent Spring*, which is the book that Carson is probably most remembered for at this point in time; although she was a famous author before she wrote *Silent Spring*, I'm going to talk some more about that tonight.

This is Rachel, and I love this photograph; this is the frontispiece of the book. I spent about seven months trying to find this photograph and then arranged to reproduce it in the book. It was made by Irving Penn, the great 20th Century portrait photography, for *Vogue* magazine. And it actually appeared in *Vogue* magazine, although again it took me several months to figure out exactly when and where. And in any event it was made in 1951, so it hasn't been seen in about six decades; this is the lost photograph of Rachel Carson, and I think by far the best photograph of her ever taken. She would have been 44 years old in this photograph, and I just think it's terrific. Penn actually shot it this way, it's not cropped to look more artistic, that's the way he photographed her.

Well looking around this audience, I suspect most of you know who Rachel Carson is, but I can tell you that generally that is not the case with a lot of people. Baby boomers and people who are older than baby boomers tend to remember Carson and her work. And young people in high school and college are studying Rachel Carson, again, in environmental studies classes and they are more likely to know who Carson is. But in between there's this great donut hole; lots and lots of people who don't know Rachel Carson, don't know *Silent Spring*. And as a result really don't understand the origins of the environmental movement, and as importantly the debate and agreements that we have around the environmental movement because they have their origins in *Silent Spring*, and in the reaction to *Silent Spring*, and in the historical context in which Carson was working. And these are questions that interested me a lot, this is part of the reason that I wrote a book about Rachel Carson, I wanted to try to understand where this movement came from, the role that she played in it, and why we have this partisan, divisive, right, left argument all the time about environmental matters. It doesn't seem logical, we all live in the same global ecosystem, this shouldn't be something that we can't agree on and yet we can't agree on it.

So Carson is the fault line, in my view, between two important aspects of our relationship with the natural world, to historical movements. The first half of the 20th Century was about conservationism, this is the idea that we should be good shepherds to the Earth, that we should preserve the resources that we have, that we should preserve the heritage of wildness that the country was premised on for future generations. And this was not a particularly controversial idea, this wasn't something that people disagreed wildly about; there's always competing interests, it's never simple to conserve something if it's sitting in somebody's way. But basically this was a non-partisan concept. And in 1962 when Carson published *Silent Spring*, the conversation shifted, to what I call environmentalism; now these terms aren't precise, they're not scientific, but they're useful constructs for thinking about what changed in 1962. Environmentalism is different from conservationism in several important ways. It's a little more pessimistic, not nearly as forward looking. It's much more immediate, it's more urgent, more dire, and with the evolution of environmental thinking we begin to focus more and more on ourselves. Where before the species of concern might have been a fish, or a bird, or a game species of some kind, or a forest. Once we began to think about the environment and our place in it, the species of concern really became us, both with what we were doing to the environment and what we were doing to ourselves in the process. So I think when we look back five decades in the rearview mirror, we can actually see the beginnings of this change in the way we think about the natural world. And I call Rachel Carson a fault line, the tipping point, between these two things. She actually had a strong presence in both the conservation movement, which I'll take about in a minute, and was really, in effect, the founder of the modern environmental movement. And I think it's possible to actually to point to a specific movement in time when that happened, when we began to think differently about the environment and our relation to it. And it came in the late summer of 1962, about a month before *Silent Spring* was even published. In June of 1962, the *New Yorker* magazine had published three long excerpts from *Silent Spring*, and through the course of the summer a huge controversy flared up around the book, and people began to take sides on it, and people began to become worried about what Carson was warning everyone about. And by the end of August this was very much in the public agenda. So I'm going to show you know a little video that I think, as good as any other,

identifies this tipping point, this place in time where we began to think about environmentalism.

(Video playing)

Alright so that's President Kennedy on August 29, 1962, that was at the tail end of his news conference. I hope you could hear it there, he was asked about pesticides and whether the government would do anything about it. Before they got to that question, there was a whole string of questions that turned out not to be unrelated, although it seemed like it at the time. Several reporters asked about this increase in Soviet shipping traffic to the Island of Cuba, and nobody knew what was happening and what that meant, but of course in a couple more months we would know exactly what that was about. And that was not in the end unrelated to what Carson was talking about in *Silent Spring*. I hope you could also hear that the President referred to Miss Carson's book in his answer. He said, "We are going to look into this problem, especially in light of Miss Carson's book." And what's interesting about that, of course, is that in 1962 no further introduction was needed; everybody knew who Miss Carson was; that was Rachel Carson, the celebrated author of three books about the ocean, beautiful, lyrical books about the ocean that were these wonderful, transforming experiences for their readers. Carson had a way of taking science and translating it into a really beautiful narrative that everybody could relate to, and so she became one of America's most celebrated and beloved authors. And with *Silent Spring*, she really turned in a very different direction. *Silent Spring* is a disturbing book, it's a worrisome book. It's a book that pointed out what we were doing to ourselves by the careless use of pesticides in many different places.

Well since it's not 1962 anymore I thought I would explain a little bit more, for you, about who Rachel Carson was. She was born in 1907 in this house in Springdale, Pennsylvania; that's just outside of Pittsburgh, just up the Alleghany River a little ways. She was born in one of the upstairs bedrooms of this house, which at the time did not have addition on the right hand side that you see, it stopped at that chimney on the right. (Showing photo of house). A very simple, very modest house, four rooms, two downstairs, and two bedrooms upstairs. There was no central heat, there was no indoor plumbing, they had a couple of outhouses out back, they had a shed in the front where

they occasionally kept a horse. And it was a little bit out in the woods, it wasn't completely in the country, but there was enough property around the house that Carson could explore the woods, often with her mother, as a child. And she really loved birds and animals, and was fascinated with nature from a very early age. She was a gifted student and a talented writer even as a young woman. She published several stories in children's magazines before she got out of high school. And she earned a scholarship to a small women's college in Pittsburgh called Pennsylvania College for Women, which it's now called Chatham University; it's still there. A beautiful little campus tucked away in a kind of wealthy neighborhood of Pittsburgh. And it was quite a step up in the world for Carson, who came from these very simple circumstances, to be on this college campus. Now later in life people always described Rachel Carson looking kind of frail and not being particularly much of a physical presence. (Photo) This is her field hockey team, she's the one standing second from the right, she looks pretty firmed jawed and sturdy in this photograph but it probably is a little bit deceiving, she never came off quite that way later in life. I think her field hockey team was class champions all four years, and she was the goalie. (Photo) This is her senior picture, and when this was taken she had undergone a pretty significant change. She went off to college originally planning to major in English and hoping to be a writer. She thought that writing was the highest possible calling, it was something that she longed to be able to call herself, something that she really loved and wanted to be able to do. But while she was in college she became very interested in biology, thanks in part to a particularly influential professor, but also because Carson had discovered that she had a genuine and deep affection for biological sciences. So she actually switched her major, and when she graduated from PCW she went off to Johns Hopkins University in Baltimore to pursue a master's degree in zoology. And she spent her summers at the Marine Biological Laboratory in Woods Hole, which is where this picture is from; this is, I think, right around 1929. Carson was thinking about getting her doctorate in either zoology or some aspect of biology, and she would have had fairly circumscribed opportunities had she done that; there were not a lot of good career paths for women coming out of college with a PhD's in the late 1920's. She could have taught, certainly, certainly at a school like the one she just graduated from, but the future was always an uncertain one. And it was made doubly so by the

onset of the Great Depression, which of course hit at the exact time that Carson had first graduated from college. So after a couple of years at Johns Hopkins earning her master's degree and doing a little bit of teaching, she really needed to find work. She was kind of the sole bread winner in her family, her father had mixed success in life, and her mother lived with Carson for most of her life. And a number of relatives were always moving in and out of the household, and Carson was always the one that actually had a job. And in the mid 1930's she went to work for the Bureau of Fisheries as an Information Specialist writing press releases and presses and pamphlets and radio scripts and doing other kinds of work like that for the Bureau of Fisheries. In 1940 the Bureau of Fisheries was merged with the Biological Survey, another federal agency, as part of President Roosevelt's reorganization plan for the federal government and those two agencies became the Fish and Wildlife Service, who are our hosts here tonight. And Carson spent the balance of her government career working for Fish and Wildlife, again mainly as an Information Specialist; she did have some scientific titles along the way. She was an Aquatic Biologist, was her job description, and she did do some scientific work for the agency, but most of what she did was in the area of communications. And she eventually became the Editor and Chief of the Fish and Wildlife Service, which meant that she oversaw all of its publications, reviewed lots of technical papers that were produced by the scientific staff, and was really sort of in charge of the outward voice of the agency to the public.

In the mid 1940's Carson had an idea for an ambitious series of booklets, pamphlets that are pretty substantial, called *Conservation in Action*. And there's seven or eight of these in all, and each of them deals with one of the newly established federal wildlife refuges, which needed to be explained to the public. The Fish and Wildlife Service wanted everyone to understand why they were taking this land and setting it aside as refuges. In some places this was controversial; sportsmen were not use to the government step in and scoop up land that they were use to hunting and fishing on. So part of the mission was to explain part of the rational for these refuges. One of these booklets was devoted not to a specific refuge, but to the subject of conservation generally; the booklet *Conservation in Action #5*. And that was published in 1948; it's really a landmark of conservation literature. And all of

these booklets demonstrated one of the things that was characteristic about Carson's work for the government, which was that it was often too good for the government. On several occasions she was advised to take things that she had written and do something else with them because her supervisors thought that the government really didn't deserve the kind of literature she was producing, and this was true of these booklets. Although in fact these were sent out to universities and extension services, you could buy one from the U.S. Printing office, but if you went to a wildlife refuge and stopped at the information kiosk, you could also pick one up and read about the refuge you are visiting. I'm going to read you just a little bit from one of these so that you can get a sense about what Carson was doing. Again this is a pamphlet that you'd get for free if you went to the Chincoteague National Wildlife Refuge.

> "Assateague is one of the barrier islands typically of the Middle Atlantic coast, never more than three miles from shore to shore, lying between Chincoteague Bay and the sea. Seen from the air, as the migrating waterfowl coming in from the north must see it, its eastern border is a wide ribbon of sand that curves around in a long arc at the southern end of the island to form a nearly enclosed harbor. Back from the beach the sand mounts into low dunes, and the hills of sand are little by little bound and restrained by the beach grasses and the low, succulent, sand-loving dune plants. As the vegetation increases, the dune falls away into salt marshes bordering the bay. Like islands standing out of the low marshes are the patches of firmer, higher ground, forested with pine and oak and carpeted with thickets of myrtle, bayberry, sumac, rose, and catbriar. Scattered through the marshes are ponds and potholes filled with wigeongrass and board with bulrushes and other good food for ducks and geese. This is waterfowl country. This is the kind of country the ducks knew in the old days, before the white man's civilization disturbed the face of the land. This is the kind country that is rapidly disappearing except where it is preserved in wildlife sanctuaries."

Well I can assure you most pamphlets turned out by any agency of the federal government rarely read quite that well. She was really quite remarkable. The one that I referenced before, *Conservation in Action #5*, which was about the whole theme of American conservation; it's a fascinating document. It is basically the description of a series of tragedies in the natural world. In which resource after resource, we overestimated the abundance and the permanence of what was there. Things that seemed too numerous to ever disappear, were in fact disappearing because we over hunted, over harvested, or we modified or destroyed habitat, and we changed ecosystems in a way that inexhaustible resources proved to be completely exhaustible. And this was published in 1948 in the same year that another American naturalist named Aldo Leopold learned that a book he'd been working on for several years called Great Possessions, was in fact going to be published; he was very excited about this. But before it could be published he was at his shack in Baraboo, Wisconsin, where he did a lot of his writing, and a brush fire broke out next door and he went to his neighbor to help fight it. And he died of a heart attack in the fire, and so he never saw his book. But his heirs negotiated with the publisher, which was eager to publish the book after Leopold's death. They only had one request, they wanted to change the title; they didn't like *Great Possessions*. So Leopold's kids said, "Well what do you want to change it to?" And they said, "We'd like to call it *A Sand County Almanac*." Which is one of the pillars of American conservationism, it's the book in which Leopold purposed what he called the land ethic. Which in simple terms argues that is our responsibility not to look not just at things in the environment or in nature that have economic value to us, that ecosystems are interrelated, and that all the species that exist in them are dependent upon one another. And that our real obligation is not economic, but moral, and that we have to do, our responsibility to the natural world is to preserve the stability and the diversity of ecosystems. And when we do things that are contrary to those interests, we have to be very careful. He didn't say we can't change the natural environment, nobody ever argues that, but we need to be aware of what we're doing, and the consequences of the actions that we take.

Well Carson moved on, she had been writing newspaper and magazine articles all the while that she worked for the federal government. And she actually published one book in 1941 that had disappeared, really without a trace; it got some good reviews but

nobody bought it. Well she tried again in 1951, and she published a book called *The Sea Around Us*, which her agent sent out chapter by chapter to magazine editors in New York hoping that somebody would publish an excerpt from. And it was finally seen by an editor at the *New Yorker* magazine, and the *New Yorker* was interested. And they asked if they could see some more of the book, and so Carson's agent began sending chapters of *The Sea Around Us* over to the *New Yorker* all through the summer of 1950. And Carson eventually got frustrated because she was impatient, she was broke, she needed money, and she told her agent she'd wish she could force the *New Yorker* to decide what chapter they wanted and publish it, because she thought maybe she'd get a thousand dollars if they did, and that would be a good thing. And towards the end of the summer they got word, Carson and her agent, that *The New Yorker* was not going to publish a chapter from *The Seas Around Us*, they were going to publish ten chapters. And the effect of that was enormous. Before *The Sea Around Us* was even published as a book it was destined to become a best seller, which it did. And it turned Carson immediately into a household name, and as I said earlier, one of the most famous writers in America. The *Sea Around Us* was number on the *New York Times* best seller list for thirty-nine straight weeks; it was on the best seller list for several years. And toward the end of the time that it was in the top ten, her publisher decided to reissue the earlier book from 1941, a book called *Under the Sea Wind*, the one that disappeared without a trace. It went on to the best seller list, and so for a period of time in early 1952, Rachel Carson had two of the top ten books in America at the same time on the best seller list. *The Sea Around Us* also won the National Book Award, which was its infancy at that time, I think it was the second or third time it had been awarded. (Photo) And this is a picture of her at the awards banquet with the other winners that year. On the far left is the poet Mary Anne Moore, who won for poetry. And in the middle is James Jones, who won for *From Here to Eternity*. I wrote in my book that Jones didn't look particularly happy that night, he looks relativity content here, but I think it must have been a difficult night for him because everybody knew he was a compromised winter. He was not anybody's first choice; two other novels had canceled each other out. One was *The Caine Mutiny* by Herman Wouk, and the other book that neutralized *The Caine Mutiny* was this odd little comic novel about a teenager called *The Catcher and the Rye*. So when those two

knocked heads Jones was the default winner. At any rate I love this picture because it's hard to imagine a more unlikely gathering than these three people. Mary Ann Moore who was this character, this high profile poet who always wore these tri-cornered hats, the young war novelist, and then Rachel Carson, zoologist turned nature writer. While this is obviously an early high point for Carson because she finally achieved her goal of becoming a writer, but it's natural to think that she moved from here to more than a decade later writing about pesticides in *Silent Spring*. But in fact she was already concerned about pesticides at this point, because six years before that photograph and before *The Sea Around Us*, she had started to look at research that was being done by the Fish and Wildlife Service on this compound called dichloro-diphenyl-trichloroethane, DDT. This is a chemical that was synthesized in the 1870's and nobody what to do with it, it didn't seem to have any practical purpose. Until a Swiss chemist in 1939, a Swiss chemist named Paul Muller, discovered that it was a potent insecticide. And it tended to last a long time on surfaces that it was sprayed on, it seemed to be deadly to every kind of insect, and also seemed to be harmless to other species that were not the targets of the poison. So it was thought to be both effective and safe right from the onset. And that certainly seemed to be the case in the early going; Paul Muller, I should add, won a Nobel Prize for discovering DDT. And during the Second World War, production of DDT was ramped up in this country and elsewhere, and it was used extensively throughout the war in theaters of operation to combat disease, and in delousing operations for refuges and people coming out of contaminated areas. And it really, really seemed to work. In 1943 the U.S. Army spayed DDT on a million civilians in Naples, Italy and halted a typhus outbreak that threatened the city.

Well through the 1940's and the 1950's and into the early 1960's, DDT kind of goes everywhere. And as it does other insecticides, chemically similar insecticides, are developed, so now there's a whole array of these pesticides coming into common use; initially in military settings. But then after the war in forestry, in agriculture, in residential, these things were used in hospitals, commercial buildings, and in homes, and in lots and lots of different products. One of the problems with spraying poison from airplanes is its really hard to control where it goes, and yet this was done extensively. I grew up in Florida where there was encephalitis, was an epidemic that crept up now

again; it's a mosquito transmitted brain disease. And trucks like this would come through my neighborhood and when they did my brothers and I would run out and get as deep into that murk as we possibly could because it was really fun. Again it was everywhere, thought to be harmless to people. Although I should say that Carson's interest in DDT was based on evidence that it was not entirely safe. Again the Fish and Wildlife Service had started testing DDT at their Patuxent Research Facility in Maryland in 1945. And from the very beginning it was clear that DDT was toxic to other species of wildlife, it didn't just target insects. It was actually toxic to every single species it was tested on. And using it in large outdoor settings was a very complicated situation, it was hard to evaluate exactly what's it affects were. Animals and birds would disperse, airplanes would drop a lot of DDT here and then miss a little area over here, so it was difficult to evaluate exactly what its affects were when it was in wide use. But it was being used everywhere, and Carson understood the data coming out the Fish and Wildlife work, which by 1948 the Fish and Wildlife Service had a biologist who's job description was DDT Problems, and he worked for the Fish and Wildlife Service at Patuxent.

So the first six pounds of DDT came into the United States in 1943, it was tested, we starting making it, by 1959 we were applying eighty million pounds of DDT a year. As I said before, it was incorporated into lots of different products used extensively in forestry and agriculture. But it was also in products that you could buy in the grocery store right next to your food. Shelf paper, for lining your kitchen shelves, would be impregnated with DDT. My mom used to line our kitchen shelves with insecticide laced shelf paper. People would spray their beds with DDT. You could buy what was called a bomb, an aerosol bomb, which was a small canister that you could put in a room, pull the pin and it would fumigated the room and treat it in as little six seconds, was the advertising claim. One of my favorites was a device that my dad owned, it was a canister of DDT that screwed onto the muffler of a lawnmower, and as you mow your lawn the hot exhaust gas would volatilize the DDT and spray out a cloud of insecticide across your lawn, so if you were having company later that day you could poison the area first before they got there.

The challenge for Carson as she thought about how to write about pesticides, was that the idea that chemicals could contaminate what she called the total environment, the

global ecosystem in a widespread; it was a very novel idea. People were really not concerned about, they didn't understand that possibility as we do today. But Carson was aware that there was a similar technology that had developed on a parallel track, one that also really got its start in 1939 and was developed during the war and then came in to wide use, if that's the right word, after the war. And she thought this other technology offered a parallel example that the public could understand, and this was one of the important premises of *Silent Spring* was drawing this connection between pesticides and this other technology, which was this one (playing video of explosion). Now that's an animation, that's not a real explosion, to be able to see it from that distance it would take eight or nine minutes for the sound wave to get to you if you were far enough away to actually see an explosion like that, but it illustrates what I'm talking about. This is not animation, this is the explosion that occurred on March 1, 1954 at Bikini Atoll in the Marshall Islands in the south Pacific; this is the first hydrogen bomb. There had actually been one hydrogen device exploded a few months before this, it wasn't a practical bomb; it was about as big as a building and it couldn't be weaponized. But this was a bomb, this was something that could be put on an airplane and dropped somewhere. This was called the Castle Bravo Test, and several things went wrong with this test. This was about four o'clock in the morning by the way; this lit up the entire sky over the south Pacific.

The first thing that went wrong was that the wind changed, the wind was supposed to be out of the north that day, and the thought was that any radioactive fallout would be blown harmlessly down towards Antarctica or at least towards unpopulated parts of (unintelligible) Pacific. But the wind shifted just before they detonated the device and it came out of the west and blew a lot of fallout out to the east of Bikini Atoll.

The second thing that went wrong was that there had been a serious miscalculation, this was new technology and there were lithium isotopes in the fuel for this bomb that were thought to be essentially inert in the explosion or to have a very low infinity for some of the neutrons that would be flying around in the milliseconds of the explosion. Well I don't even understand the chemistry, but the lithium liked the neutrons a lot better than the physicists thought that it would. And the result was that this explosion went off at about 250% of the anticipated yield, it was two and a half times more powerful than anybody expected it to be. And of course by far already the most

powerful explosion that had ever occurred anywhere on the face of the Earth. The guys who pushed the trigger knew something was wrong right away, they were in a bunker on the other side of a lagoon about thirty miles away from the device. And a couple of seconds after they touched the trigger and the fireball went off, but before they could even hear anything, the bunker started to move backwards. And they realized that what was happening was that they were feeling the ground shock, which travels faster than the speed of sound. And no one had ever felt that before because normally the earth absorbs the ground shock, but this explosion was so big that it actually rocked this bunker thirty miles away and alarmed everybody right away.

The third thing that went wrong with this test was that it sent thousands of tons of highly eradiated coral and pulverized sand up into the stratosphere, where a lot of it starting blowing around in the jet stream. But a fair amount of it fell back to the ocean, downwind of the test, and this Japanese fishing boat, which was called The Lucky Dragon, on this very unlucky day was fishing about ninety miles away east of the test. And the ship ended up being coated with the fallout, it came down like snow, this gray ash that fell on every exposed surface, it got in every part of the ship. These guys saw the explosion, they didn't know what had happened, they didn't understand what was coming down on the ship. So a number of them scooped up little samples of this stuff to save, they would put it under their pillows. Some of them tasted it to see if it was salt because it kind of looked like salt. Well by the time the Lucky Dragon got back to Japan everybody had radiation poisoning, the men had turned black, their skin turned black, their eyes were oozing; they were frightening to look at. The ship was immediately towed off to the other side of the harbor, and kept away from everybody and ultimately burned at sea. The crew spent a year in the hospital in Tokyo where they had some experience in dealing with radiation sickness after the two bombs that we dropped on Japan in 1945, and eventually they all recovered except for the radioman, a guy named Kuboyama, who seemed well after a while but ultimately died of liver failure. Well this was a huge international incident, and the United States had to pay reparations to the families. They had to pay damages to the fishing industry because tuna throughout that part of the Pacific turned up with radioactive burdens for weeks and years afterwards, so this was a serious, serious problem. And one that Carson was determined to explore in *Silent*

Spring, she really thought that what was happening with pesticides was very similar to what was happening with fallout from nuclear testing. I should explain for those of you who maybe don't remember, we used to blow these up all the time. In total there were about 500 above ground atmospheric tests of nuclear weapons between 1945 and 1963 when just about everybody stopped doing it. Most of those were by the United States and the Soviet Union. The United States tested about 200 atomic and hydrogen bombs in the atmosphere during that period. In June of 1962 when Carson's book was being serialized in *The New Yorker*, the United States tested ten nuclear devices, so one every three days while *Silent Spring* was being serialized, in *The New Yorker*. I want to read a little bit from my book and there's a little bit Carson here so I'll try to identify that for you, but this is a little bit about how that connection was made in the book.

> "Three long excerpts from Silent Spring ran in executive weekly issues of *The New Yorker* beginning on June 16, 1962. Although abridged, Carson's story began in the magazine almost word for word as it would in the book. With a short foreboding fable that would become one of the great set places in American literature. In it Carson imagined a nameless town in the heart of America where all life seemed to live in harmony with its surroundings. This idyllic place flanked in every direction by lush farm fields and cold, clearing running trout streams was home to an abundance of wildlife, foxes, and deer, and especially birds. An aviary so rich during the migrations of spring and fall that people traveled great distances just to see it. 'So it had been' Carson wrote, 'since the days many years ago when the first settlers raised their houses, sank their wells, and built their barns.' But then a strange blight invaded the area, it was like an evil spell that brought with it unexplainable sickness and death to livestock. Chickens laid eggs that did not hatch, cattle and sheep turned up dead, pigs gave births to stunted litters that lived only days. The fish in the rivers died and the trout anglers stayed away, people too fell ill, some died leaving their families grieving and their doctors perplexed. The roadsides, formerly lush with bushes and wildflowers, were now brown and withered as though swept by fire. Here and there a mysterious white powder clung to the rooftops and

lay in the gutters of the houses in the town, deadly traces of something that had fallen like snow from the sky only weeks before. And everywhere there was an ominous quiet, a silence that closed off the town and its surroundings from the living world as if the area had become entombed.
(Excerpt from Silent Spring, page 2) 'There was a strange stillness. The birds, for example—where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh.'

In the space of just ten paragraphs the *New Yorker* combined them into three; Carson written the story of the end of the world. What reader in 1962 could fail to see in this description all the bleak possibilities of the modern age. Carson's subject was pesticides, but she began in a way that as surely evoked the images of nuclear devastation and all this ensuing sickness and pallor right down to the residue if poison from the sky. This was a familiar tab low as the Cold War had offered a running preview of such scenes of annihilation in the picture many Americans already had of the colorless, lifeless void that resided behind the Iron Curtain, where an oppressive society was understood to be functionally dead but at the same time a deadly threat. In September 1961, the Soviet Union had resume atmospheric testing and by early December had detonated thirty-one nuclear devices, including one more than 3, 300 times the size of "Little Boy", the bomb that destroyed Hiroshima. Though not a practical bomb, this gargantuan device produced the largest nuclear explosion in history. The United States immediately embarked on a crash program to restart its own testing in the south Pacific, and did so in April 1962 just as Carson was finishing *Silent Spring*. The testing continued at a furious pace through the spring and into the summer and then fall. In the month of June alone, as

> readers were learning of the dark promised of pesticides from Rachel Carson in *The New Yorker*, the United States exploded ten nuclear devices in the atmosphere. That year a nuclear device exploded somewhere in the world every few days."

So this was the context for *Silent Spring*, this was the parallel that Carson drew that would allow the public for the first time to see that the idea of a containment, invisible, ambiguous, not well understood could enter into the environment on a widespread basis and containment the total ecosystem.

In early 1963 the CBS television network did a program about *Silent Spring*, they interviewed Rachel Carson and her critics, who were (unintelligible); she was embroiled in a huge controversy surrounding *Silent Spring*, which had been attacked viciously by the chemicals industry. They were protecting their interests, of course, but there was also an argument that was offered that what Carson had proposed in *Silent Spring* was in some way fundamentally un-American. Because what she was asking the country to do was to take a look at economically, important class of products, determine whether they presented a danger to the public, and if so to extend the reach of government into the private sector to regulate them and to do something about it. And of course that's not an unfamiliar argument, I think if you go listen to the debate later tonight you'll probably hear the same thing still going on to this day. When President Kennedy indicated that the government was going to do something about pesticides, he actually meant it. He appointed a Presidential Commission the day after that press conference, that I should you in the beginning, and that Commission reported back in the spring of 1963 essentially saying that everything Carson had claimed in *Silent Spring* appeared to be true. That pesticides persisted in the environment, that they were stored in the tissues of living things and therefore became amplified through bio-accumulation from repeated exposures and also from moving up the food chain as one animal ate another one that had a body burden of DDT in it, these things became magnified. This all appeared to be true, now this Commission didn't have any practical polices to purpose immediately to do much about pesticides, but it did set the conservation in motion. And so again we point to this time frame a year or so, 1962 and into 1963, as a real turning point in our discussion of the environment and our relationship to it. I want to show you a little bit

about, a little excerpt from that CBS documentary so that you can see and hear Rachel Carson herself. You'll see her at the beginning of this clip, by the way, at her cottage in Maine. After she became a well to do author and left government service, she built a house near Boothbay Harbor, Maine on Southport Island overlooking the ocean. She loved this location, she loved the marine life that was in the tide pools at the foot of the cliff that she was on, and this was her summer destination ever after. It's still there and I lived in it for a week when I was working on this book and I actually wrote parts of one of the chapters in my book at Rachel Carson's desk, which is there just as it was the day she left. Her family still owns the cottage and unfortunately they haven't tried to fix it up, they maintain it but they haven't renovated so it looks just the way that it did when she was there. Let's take a look at Rachel Carson. (Plays video.)

I remember scenes like that, do some of you remember seeing the fogging trucks coming through the neighborhoods with DDT; it certainly was a different time.

Well Rachel Carson did not live to see the environmental movement blossom and flow out of what she started. She was halfway through with *Silent Spring* when she discovered she had breast cancer. And it was at an advance stage and it was not diagnosed well, her treatment was inadequate to halt the disease and so she continued to fight her illness during the second two years that she was at work; took about four years to write the book and she was sick about half the time with her cancer and a variety of other illnesses. But she was a strong person, and I think a brave person. Certainly stood up to the people who attacked *Silent Spring*, she was more than capable of defending herself against her critics, and she did so very ably. And she was also, I think, quite brave in confronting her illness in the fact that she would not live to see really the fruits of her labor. She died in April of 1964 at the age of 56. And it took about six years for something really concrete to happen as a response to *Silent Spring*. There were many things that did happen in the ensuing years, but the really watershed event was when President Nixon signed into Law, created the Environmental Protection Agency. And one of the first orders of business of the EPA was to ban a series of insecticides starting with DDT, and including all of its other cousins, many of which were more toxic than DDT. And that domestic ban, that is the ban on the use of those in this country, went into effect in 1972 or they began phasing them out in 1972. And it's too bad that Carson

didn't live to see that, but she didn't. And I like to think of her in this photograph, which was taken by her friends the Freedman family, who lived next door to her in Maine. This is on the shoreline of Southport Island in Maine about 1955 probably, it's one of my favorite photographs of her; she looks very content in this picture, I think, and very much someone who was at home in that environment, and at home in the world, and at home in her role as an author, a scientist, and ultimately somebody who would change the way we think about things. And I think that's a good place to stop and take any questions you have.